Arizona Water Supply Outlook

and

Federal-State-Private Cooperative Snow Surveys

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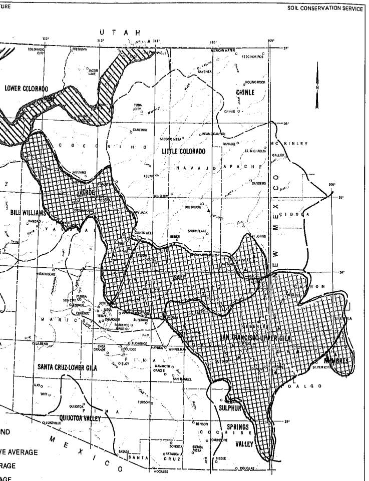


STREAMFLOW PROSPECTS

ARIZONA

MARCH 1985 4-R-39105

GENERAL OUTLOOK

SUMMARY:

Weather conditions remained dry throughout January causing a further reduction in the forecasts for streamflow over the February-May period in Arizona and western New Mexico. Storage in major reservoirs, which is still above average for February 1, will be a very important factor in surface water supplies in 1986. Over the next four months the Verde River is forecast to run 35% of average and the Salt River, 28%, with Tonto Creek expected to produce only 12% of average runoff. Inflow to the Salt River Project reservoirs from these three streams is forecast to be 215,000 acre feet. The San Francisco River is forecast to produce 42% of average flow at Clifton and Glenwood. It is anticipated that the Gila River will run 48% of average at Gila, 44% at Virden, 38% at the Head of Safford Valley, and 32% at Calva. Inflow to San Carlos reservoir is forecast at 40,000 acre feet. The Little Colorado River flow should be 45% of normal at Greer and 29% at Lyman reservoir. The Mimbres River is forecast to have 33% of average runoff. Spring runoff on the mainstream Colorado River is forecast to be 127% of average with 9,500,000 acre feet inflow to Lake Powell. Small watersheds contributing to reservoirs such as Lake Mary near Flagstaff and Willow and Watson Lakes near Prescott are expected to produce very little runoff.

SNOWPACK:

The Arizona-western New Mexico snowpack is much below average for February 1. Snow surveys and telemtry readings confirm a decrease in snow water equivalent as well as percent of average. This is due to a combination of much below average precipitation and loss from melt during periods of above average temperatures during January. Major basins have a February 1 snowpack ranging between 24% and 28% of average. The Grand Canyon area is down to 51%. Only the San Francisco Peaks and the Chuska Mountains are near average.

PRECIPITATION:

January precipitation was almost non existant. The percent of average precipitation received was 10% on the Verde and Lower Colorado areas, 17% on the Salt River, 18% over the Little Colorado basin, 11% on the San Francisco-Gila drainage, and 28% on the Mimbres. Storm systems began to enter the state just before February 1 and more storms are expected. This may alleviate the situation somewhat as February progresses.

RS: Reservoir storage on February 1 was above average in the major impoundments around Arizona. Salt River Project reported a system wide storage of 1,655,000 acre feet at 82% of capacity. San Carlos reservoir was 90% full with 840,000 acre feet. Lake Pleasant held 83,000 acre feet, 53% full. Storage in Lakes Powell, Mead, Mohave, and Havasu totaled 48,116,000 acre feet which accounts for 90% of the storage capacity. Smaller reservoirs appear to be maintaining their storage levels so far. Lyman reservoir contains 23,600 acre feet and Show Low Lake, 2000 acre feet. Watson Lake holds about 3700 acre feet and Willow Lake, 3600 acre feet. (Note: In the January 1, 1986 Water Supply Outlook, the reservoir storage volumes listed as "THIS YEAR" and "LAST YEAR" were interchanged. These columns should be switched.)

OW: Preliminary streamflow figures show much below average runoff on major streams during the month of January. This continues the trend that began in December.

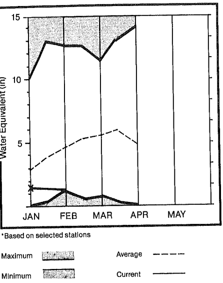
Preliminary Streamflow - January 1986

Stream	Thousands Acre Feet	Percent of Average
Salt River	22.0	41
Verde River	18.4	38
Tonto Creek	2.5	12
San Francisco River		
Clifton	7.7	51
Gila River		
Virden	8.6	57
Solomon	16.0	47
Calva	16.7	52

All streamflow forecasts are coordinated between the Soil Conservation Service and the National Weather Service. All averages and percentages of average are based on the 20 year period 1961-1980.

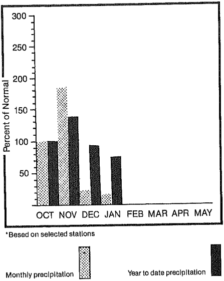
Salt River Basin

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

WATER SUPPLY OUTLOOK:

February 1, 1986

February-May forecasts call for 28% of average runoff on the Salt River and 12% of average on Tonto Creek. The February 1 snowpack was down to 26% of average. January precipitation was only 17% of average, bringing the water year precipitation to 74%. Observed January runoff on the Salt River was 41% of average and Tonto Creek, 12%. The four Salt River Project reservoirs were 84% full on February 1 with 1,442,000 acre feet in storage. Lake Pleasant held 83,000 acre feet at 53% of capacity.

SALT RIVER BASIN

STREAMFLOW FORECASTS

	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
Roosevelt	FEB-MAY	412.9	115.0	27	86	18				
	FEBRUARY	83.0	15.0	18						
Roosevelt	FEB-MAY	76.8	9.0	11	70	8				
	FEBRUARY	28.0	2.0	7						

RESERVOIR STORAGE (1000AF)

RVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
YSTEM	1709.0	1442.0	1581.2	1150.6
	157.6	82.6	113.7	71.0

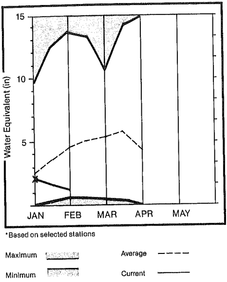
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
SALT RIVER	8	14	25

upstream diversions or changes in reservoir storage.
r 1961-80 period.

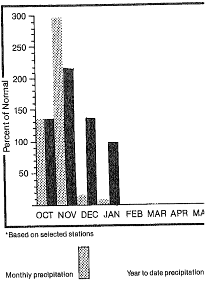
Verde River Basin

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

February 1, 1986

WATER SUPPLY OUTLOOK:

Runoff on the Verde River basin will be below average over the February-May period. The Verde is forecast to run 35% of average. Inflow to Lake Mary is only expected to be about 2200 acre feet. Granite Creek forecast is down to 60 acre feet and Willow Creek, 500 acre feet. Seasonal precipitation since October 1 is about normal, but January was only 10% of average. The February 1 snowpack was 27% o average. The San Francisco Peaks still maintain a near average snowpack due to snow received in November. Bartlet and Horseshoe reservoirs held a combined storage of 213,000 acre feet on February 1 at 69% of capacity. Storage in Watson Lake was 3670 acre feet and in Willow Lake, 3550 acr feet. The Verde River only ran 38% of average during January.

VERDE RIVER BASIN

STREAMFLOW FORECASTS

INT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
bove Horseshoe	FEB-MAY	260.1	91.0	34	141	20				
	FEBRUARY	79.0	13.0	16						
	FEB-MAY	-----	0.6							
	FEB-MAY	-----	0.5							
OW	FEB-MAY	-----	2.2							

RESERVOIR STORAGE (1000AF)

ESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
S SYSTEM	309.6	212.9	248.8	127.5
	4.7	3.7	4.5	2.7
	6.1	3.6	6.1	2.7

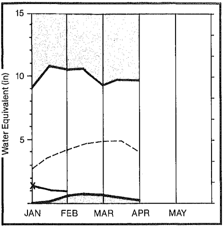
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.O	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
VERDE RIVER	10	15	28
SAN FRANCISCO PEAKS	4	60	106

or upstream diversions or changes in reservoir storage.
for 1961-80 period.

San Francisco - Upper Gila River Basin

Mountain snowpack* (inches)

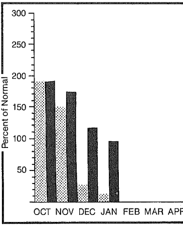


*Based on selected stations

Maximum ▨ Average - - - -

Minimum ▨ Current ———

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▨ Year to date precipl

WATER SUPPLY

OUTLOOK:

February 1, 1986

The overall Gila River basin is expected to produce abou 40% of average February-May runoff. The San Francisco R at Clifton is forecast at 42%. The Gila forecast is 44% Virden, 38% at Head of Safford Valley, and 32% at Calva. Inflow to San Carlos reservoir is predicted at 35,000 ac feet. The February 1 snowpack was 24% of average. Wate year precipitation has been 95% of normal, but January w only 11% of average. San Carlos reservoir was at 90% of capacity on February 1 with 840,000 acre feet. Painted on the lower Gila held 22,200 acre feet. Observed Janua runoff was 51% of average on the San Francisco at Clifto The Gila ran 57% at Virden, 47% at Solomon, and 52% at Calva.

SAN FRANCISCO - UPPER GILA RIVER BASIN

STREAMFLOW FORECASTS

T POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LO DA
ISCO RIVER at Glanwood	FEB-MAY	36.0	15.0	41	156	14				
ISCO RIVER at Clifton	FEB-MAY	79.7	33.0	41	189	15				
R at Gila	FEB-MAY	60.0	29.0	48	142	23				
R near Virdan	FEB-MAY	76.9	34.0	44	146	18				
R near Soloson	FEB-MAY	166.0	63.0	37	199	13				
	FEBRUARY	53.0	14.0	26						
R at Calva	FEB-MAY	124.0	40.0	32	185	7				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
S	935.0	840.2	963.1	262.9
OCK DAM	2492.0	22.2	198.7	----

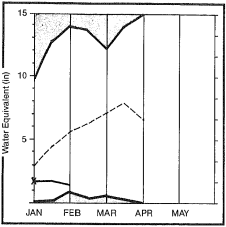
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS LAST YR.	AVE
SAN FRANCISCO/GILA RIVER	7	13	2

iad for upstream diversions or changes in reservoir storage.
is for 1961-80 period.

Little Colorado River Basin

Mountain snowpack* (inches)



*Based on selected stations

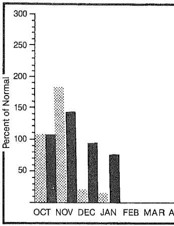
Maximum ▨

Minimum ▨

Average – – – –

Current ———

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▨

Year to date prec

LITTLE COLORADO RIVER BASIN

STREAMFLOW FORECASTS

POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
RADO RIVER at Greer	FEB-JUN	8.3	3.7	44	157	12				
RADO RIVER ab Lyman Res	FEB-JUN	13.6	3.9	28	140	7				
RADO RIVER at Woodruff *	NOV-JUN	17.3	6.0	34	156	17				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
VOIR	---	23.6	25.2	-----
KE	5.1	2.0	5.1	-----

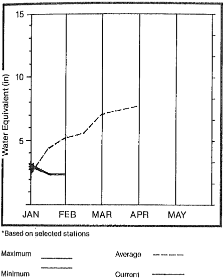
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LITTLE COLORADO RIVER	5	17	27
CHUSKA MOUNTAINS	5	66	100

d for upstream diversions or changes in reservoir storage.
is for 1961-80 period.

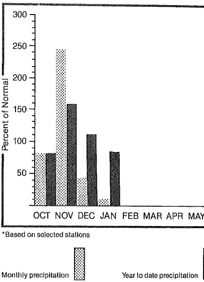
Lower Colorado River Basin

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

WATER SUPPLY OUTLOOK:

February 1, 1986

The April-July forecast for the Colorado River inflow to Lake Powell is 9,500,000 acre feet at 127% of average. The Virgin River is forecast to run 81% of average April through June. The snowpack in the Grand Canyon area was down to 51% of average on February 1. Precipitation over northwestern Arizona was only 10% of average in January. The water year so far has received 87% of average precipitation. The Colorado River reservoirs, Powell, Mead, Mohave, and Havasu, reported a combined storage of 48,116,000 acre feet near February 1. This is 90% of capacity. Releases from these dams were expected to range between 14,900 cfs and 23,000 cfs on February 1.

LOWER COLORADO RIVER BASIN

STREAMFLOW FORECASTS

INT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
near Littlefield	APR-JUN	62.0	50.0	80	139	32				
E POWELL *	APR-JUL	7462.0	9500.0	127	170	89				

RESERVOIR STORAGE (1000AF)

ESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
	619.4	572.2	551.9	545.9
	1810.0	1647.0	1715.2	1671.0
	26159.0	23147.0	23938.0	18312.0
	25002.0	22750.0	21989.0	11851.0

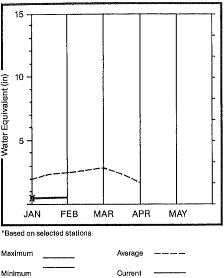
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
LOWER COLORADO RIVER	2	29	50

for upstream diversions or changes in reservoir storage.
s for 1961-80 period.

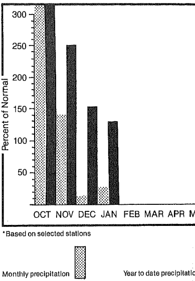
Mimbres River Basin

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

MIMBRES RIVER BASIN

STREAMFLOW FORECASTS

OINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
R near Mimbres	FEB-MAY	4.5	1.5	33	178	22				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
MIMBRES RIVER	3	14	28

for upstream diversions or changes in reservoir storage.
s for 1961-80 period.

DATA SITES USED TO DETERMINE SNOW PACK WATER

SALT RIVER

- Baldy
- Beaverhead
- Coronado Trail
- Forest Dale Alternate
- Hannagan Meadows
- Heber
- Maverick Fork
- Workman Creek

VERDE RIVER

- Baker Butte
- Baker Butte #2
- Chalender
- Copper Basin Divide
- Fort Valley
- Gaddes Canyon
- Happy Jack
- Mingus Mountain
- Morman Mountain
- Mormon Mt. Summit #2
- White Horse Lake Jct.
- Williams Ski Run

GILA/SAN FRANCISCO RIVER

- Beaverhead
- Coronado Trail
- Frisco Divide
- Hannagan Meadows
- Signal Peak Snotel
- Silver Creek Divide
- State Line

LITTLE COLORADO RIVER

- Baldy
- Cheese Spring
- Heber
- Nutrioso
- Promontory Butte

LOWER COLORADO RIVER

- Bright Angel
- Grand Canyon

SAN FRANCISCO PEAKS

- Inner Basin #1
- Inner Basin #2
- Snow Bowl #1 Alternate
- Snow Bowl #2

CHUSKA MOUNTAINS

- Bowl Canyon
- Tsaile Canyon #1
- Tsaile Canyon #2
- Wheatfields
- Whiskey Creek

MIMBRES RIVER

- Emory Pass #2
- McKnight Cabin
- Signal Peak Snotel

STATIONS USED TO DETERMINE PERCENT OF NORMAL PRECIPITATION

SALT RIVER

Alpine R.S.
Baldy Snotel
Black River Pumps
Buck Spring Snotel
Coronado Trail Snotel
Hannagan Meadows Snotel
Heber Snotel
Maverick Fork Snotel
Pleasant Valley R.S.
Promontory Snotel
Sierra Ancha
Tonto Fish Hatchery
Wildcat Snotel
Workman Creek Snotel

LITTLE COLORADO RIVER

Baldy Snotel
Buck Spring Snotel
Flagstaff
Heber Snotel
Holbrook
Mormon Mountain Snotel
Promontory Snotel
Springerville
Tuba City
Window Rock

LOWER COLORADO RIVER

Bright Angel
Colorado City
Fredonia
Grand Canyon
Kingman
Page
Williams

VERDE RIVER

Ashfork
Baker Butte Snotel
Beaver Creek R.S.
Copper Basin Divide
Flagstaff
Fort Valley
Fry Snotel
Happy Jack
Mingus Mountain
Mormon Mountain Snotel
Payson R.S.
Prescott
Sugar Loaf Snotel
White Horse Lake Snotel

GILA/SAN FRANCISCO RIVER

Alpine R.S.
Beaverhead R.S.
Clifton
Coronado Trail Snotel
Frisco Divide Snotel
Hannagan Meadows Snotel
Lookout Mountain Snotel
Luna R.S.
Reserve R.S.
Safford Exp. Farm
Signal Peak Snotel
Silver City
Silver Creek Divide Snotel
Fort Bayard

MIMBRES RIVER

Mimbres R.S.
Signal Peak Snotel